

Claims

1. A value document, in particular bank note, having a value document substrate and different feature substances for checking the value document, characterized in that a first feature substance is incorporated into the volume of the substrate of the value document, and second and third feature substances are applied to the value document substrate in a printing ink jointly and in the form of a coding, the second feature substance being formed by a luminescent substance, and the third feature substance by a material absorbent in a special spectral range.
2. The value document according to claim 1, characterized in that the first feature substance is distributed substantially uniformly within the volume of the value document substrate.
3. The value document according to claim 1 or 2, characterized in that the third feature substance absorbs in the infrared spectral range.
4. The value document according to claim 3, characterized in that the third feature substance is substantially colorless or has only weak inherent color in the visible spectral range.
5. The value document according to claim 3 or 4, characterized in that the third feature substance absorbs significantly in the spectral range above about 1.2 μm , preferably in the spectral range from about 1.5 μm to 2.2 μm .
6. The value document according to at least one of claims 3 to 5, characterized in that the third feature substance has no significant absorption at a wavelength of about 0.8 μm .
7. The value document according to at least one of claims 3 to 6, characterized in that the third feature substance comprises a doped semiconductor material or a metal oxide.

8. The value document according to at least one of claims 3 to 7, characterized in that the third feature substance is present in the printing ink in particle form with an average particle size smaller than 50 nm.
9. The value document according to at least one of claims 3 to 7, characterized in that the first feature substance is formed by a luminescent substance emitting in the absorption range of the third feature substance.
10. The value document according to at least one of claims 1 to 9, characterized in that a fourth feature substance is applied to the value document substrate, preferably printed thereon, which is preferably different from the first to third feature substances.
11. The value document according to at least one of claims 1 to 10, characterized in that the first and/or fourth feature substance is formed by a luminescent substance or a mixture of luminescent substances.
12. The value document according to at least one of claims 1 to 11, characterized in that at least one of the feature substances is formed on the basis of a host lattice doped with rare earth elements.
13. The value document according to at least one of claims 1 to 12, characterized in that the coding extends over a predominant part of a surface of the value document, in particular over the substantially total surface of the value document.
14. The value document according to at least one of claims 1 to 13, characterized in that the coding is a bar code.
15. The value document according to at least one of claims 1 to 14, characterized in that the coding is information about the value document, the information preferably being present in encrypted form.
16. The value document according to at least one of claims 1 to 15, characterized in that the value document substrate comprises a printed or unprinted cotton paper.

17. The value document according to at least one of claims 1 to 16, characterized in that the value document substrate comprises a printed or unprinted plastic film.
18. The value document according to claim 10 and at least one of claims 1 to 17, characterized in that the fourth feature substance is printed on the value document substrate together with a printing ink, in particular a visible printing ink, in the form of a printed image.
19. The value document according to claim 18, characterized in that the printed image is a coding, in particular a bar code or an alphanumeric character string.
20. The value document according to at least one of claims 1 to 19, characterized in that the value document has a further printed layer which partly or completely covers the value document areas provided with the second and third feature substances.
21. The value document according to claim 20, characterized in that the further printed layer is opaque in the visible spectral range and is transparent or translucent in the emission range of the second feature substance and/or in the absorption range of the third feature substance.
22. The value document according to claim 18 or 19 and according to claim 20 or 21, characterized in that the further printed layer is formed by the printing ink containing the fourth feature substance.
23. A method for producing a value document according to any of claims 1 to 22, characterized in that the first feature substance is incorporated into the volume of the value document substrate, and the second and third feature substances are applied to the value document substrate in a printing ink jointly and in the form of a coding.
24. The production method according to claim 23, characterized in that a fourth feature substance is applied to the value document substrate, in particular printed thereon.

25. The production method according to claim 24, characterized in that the printing ink containing the second and third feature substances, and the fourth feature substance are applied to the value document substrate as a mixture or as separate substances.
26. The production method according to claim 24 or 25, characterized in that the fourth feature substance is printed on the value document substrate together with a printing ink, in particular a visible printing ink, in the form of a printed image.
27. A method for checking or processing a value document according to any of claims 2 to 22, wherein the authenticity of the value document is checked and a value recognition of the document carried out by using at least one characteristic property of the first and/or second feature substance for checking the authenticity of the value document, and the coding formed by the second and/or third feature substance for the value recognition of the value document.
28. The method according to claim 27, characterized in that at least one characteristic property of the first feature substance is used for checking the authenticity of the value document, and the coding formed by the third feature substance for the value recognition of the value document, by a user of a first user group.
29. The method according to claim 27 or 28, characterized in at least one characteristic property of the second feature substance is used for checking the authenticity of the value document, and the coding formed by the second feature substance for the value recognition of the value document, by a user of a second user group.
30. The method according to claim 27, characterized in that at least one characteristic property of the first and/or fourth feature substance is used for checking the authenticity of the value document, and the coding formed by the third feature substance is used for the value recognition of the value document, if the user belongs to the first user group, and at least one characteristic property of the second feature substance is used for checking the authenticity of the value document, and the coding formed by the second feature substance is used for the value recognition of the value document, if the user belongs to the second user group.

31. The method according to at least one of claims 27 to 30, characterized in that, for value recognition by a user of the first user group, the coding is irradiated with radiation from the absorption range of the third feature substance, the absorption of the coding is determined at a wavelength from the irradiation range, and the value recognition is carried out on the basis of the determined absorption.
32. The method according to claim 31, characterized in that the irradiation of the coding is effected in the infrared spectral range.
33. The method according to claim 31 or 32, characterized in that the determination of the absorption is performed in spatially resolved fashion.
34. The method according to at least one of claims 27 to 33, characterized in that, for value recognition by a user of the first user group, at least a partial area of the value document is irradiated with radiation from the excitation range of the luminescent first feature substance, the emission of the first feature substance is determined at a wavelength from the absorption range of the third feature substance, and the value recognition is carried out on the basis of the determined emission.
35. The method according to claim 34, characterized in that the irradiation of the coding is effected in the infrared spectral range.
36. The method according to claim 34 or 35, characterized in that the determination of the emission is performed in spatially resolved fashion.
37. The method according to at least one of claims 34 to 36, characterized in that the emission of the first feature substance is determined on opposite sides of the value document, the value recognition being preferably performed on the basis of a comparison of the emission determined on opposite sides.
38. The method according to at least one of claims 27 to 37, characterized in that, for the authenticity check and value recognition by a user of the second user group, the coding is irradiated with radiation from the excitation range of the second feature substance, the emission of the coding is determined at at least one wave-

length from the emission range of the second feature substance, and the check of authenticity and/or the value determination is carried out on the basis of the determined emission.

39. The method according to claim 38, characterized in that the second feature substance is irradiated with visible and/or infrared radiation, and the emission of the second feature substance is determined in the infrared spectral range.
40. The method according to at least one of claims 27 to 39, characterized in that the irradiation is performed with a light-emitting diode or laser diode.